

CLAIMS

1. An appearance inspection device for a rod-like article comprising:

5 a main feeding path for feeding a rod-like article with a first zone of an outer peripheral surface of the rod-like article exposed, said main feeding path having a first and a second feeding phase that are different from each other with respect to feeding of the rod-like article
10 and being capable of receiving the rod-like article in said first feeding phase,

 a bypass-feeding path for receiving the rod-like article in said first feeding phase from said main feeding path to convey the rod-like article and then returning the
15 rod-like article onto said main feeding path so that the rod-like article is fed in said second feeding phase, said bypass-feeding path conveying the rod-like article with a second zone of the outer peripheral surface of the rod-like article exposed, the second zone being different from the
20 first zone, wherein the first and second zones cover the entire outer peripheral surface of the rod-like article, and

 imaging means for collect image data of the entire outer peripheral surface of each rod-like article in a
25 process of feeding the rod-like article on said main and bypass-feeding paths, said imaging means including a single inspection camera for directly or indirectly imaging the first and second zones of the rod-like article.

2. The device according to claim 1, wherein

30 the inspection camera is so disposed as to directly image the first zone of a target rod-like article on said main feeding path, and

 the imaging means further includes a plurality of

reflecting members for providing a reflected image of the second zone of the target rod-like article for the inspection camera when the target rod-like article is conveyed on said bypass-feeding path.

5 3. The device according to claim 2, wherein

the reflecting members provide reflected images of two portions obtained by subdividing the second zone for the inspection camera, respectively.

4. The device according to claim 3, wherein

10 the inspection camera simultaneously images the first zone of one rod-like article on said main feeding path and the second zone of another rod-like article on said bypass-feeding path.

5. The device according to claim 1, wherein

15 said bypass-feeding path receives the rod-like article from a bypass position of said main feeding path to convey the rod-like article and then returns the rod-like article to said main feeding path at a returning position located downstream from the bypass position.

20 6. The device according to claim 5, further including a downstream bypass-feeding path situated downstream from said bypass-feeding path on said main feeding path, and

the inspection camera is located to face said main feeding path extending between the bypass position for said upstream bypass-feeding path and a returning position for
25 said downstream bypass-feeding path and directly images the first zone of a target rod-like article on said main feeding path, wherein

said imaging means further includes:

30 a first reflecting member for providing a reflected image of a part of the second zone of the target rod-like article for the inspection camera when the target rod-like article is conveyed on said upstream bypass-feeding path,

and

a second reflecting member for providing a reflected image of the rest of the second zone of the target rod-like article for the inspection camera when the target rod-like article is conveyed on said downstream bypass-feeding path.

7. The device according to claim 6, wherein

the inspection camera simultaneously images the first zone of one rod-like article on said main feeding path, the part of the second zone of another rod-like article on said upstream bypass-feeding path, and the rest of the second zone of further another rod-like article on said downstream bypass-feeding path.

8. The device according to claim 1, wherein

said main feeding path includes:

a rotatable main drum, and

a plurality of feeding flutes provided on an outer peripheral surface of the main drum, the feeding flutes being arranged at regular intervals in a circumferential direction of the main drum and being classified into every other receiving flutes of said first feeding phase capable of receiving rod-like articles at a receiving position and the rest of the receiving flutes of said second feeding phase while the main drum rotates, and

said bypass-feeding path includes:

a bypass drum train situated in a vicinity of the main drum, the bypass drum train including a plurality of fluted drums for receiving a rod-like article from the receiving flute of said first feeding phase of the main drum to convey the rod-like article and then returning the rod-like article to the receiving flute of said second feeding phase of the main drum.